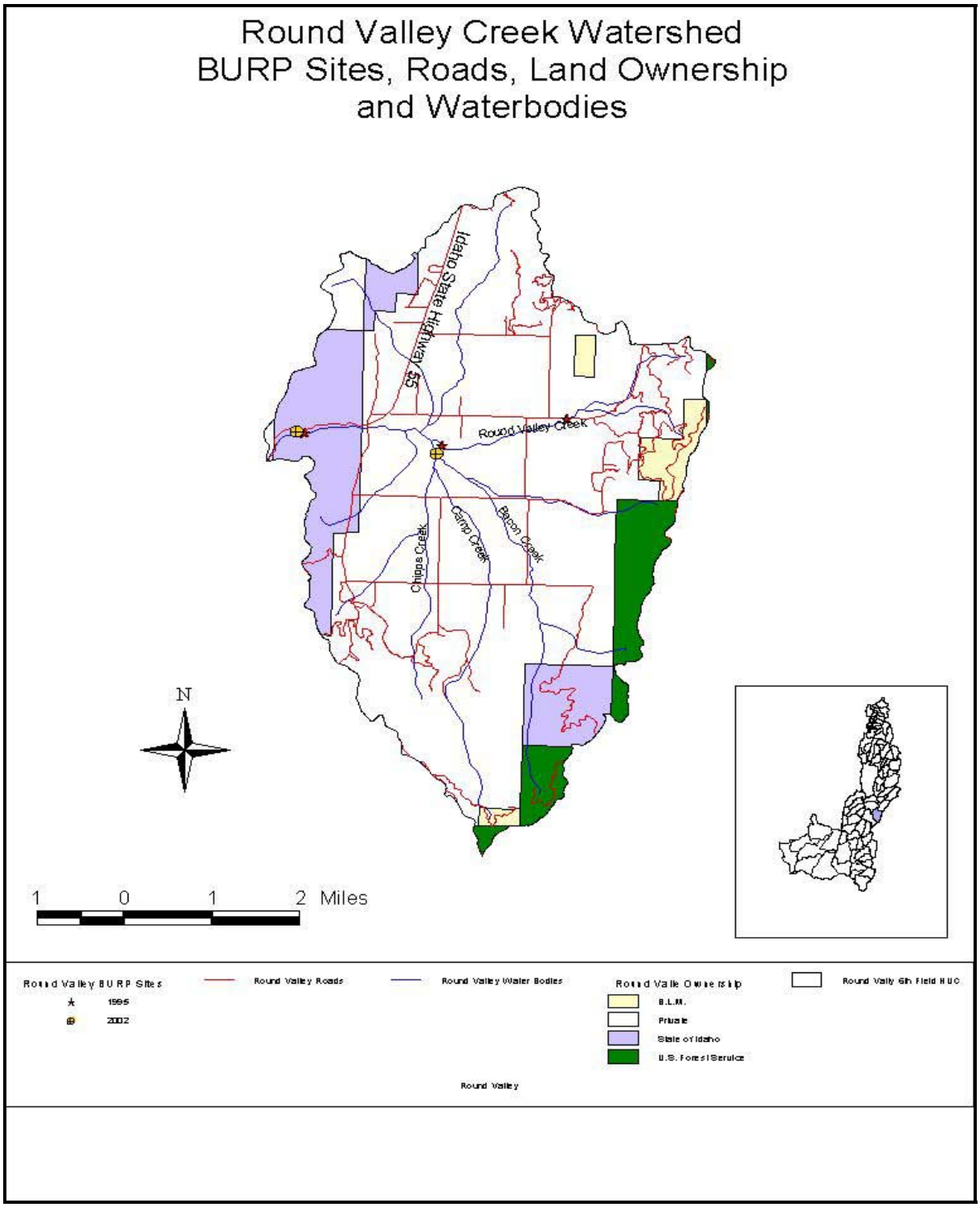

Figure 72. Round Valley Creek Monitoring Sites.

Figure 73. Round Valley Creek.

Riparian-wetland species include beaked sedge (*carex rostrata*), nebraska sedge (*carex nebrascensis*), baltic rush (*juncus balticus*), horsetail (*equisetum arvense*), watercress (*rorippa nasturtium-aquaticum*), red-osier dogwood (*cornus sericea*), brook grass (*catabrosa aquatica*), hardstem bulrush (*scirpus acutus*), fowl manna grass (*glyceria striata*), drummond willow (*salix drummondiana*), yellow willow (*salix lutia*), and geyers willow (*salix geyeriana*). In general, riparian zones were dominated by sedge/grass communities and to a lesser extent by willow/sedge communities.

Flow Characteristics

Little flow information exists for Round Valley Creek. The creek has been redirected and channelized in sections, affecting the flow regime. The lack of sinuosity in parts of Round Valley Creek allows for higher, more erosive flow action. Round Valley Creek typically flows over its banks during peak flows as a result of snow melt, particularly rain-on-snow events. Round Valley Creek peaks earlier than other creeks in the area because it starts at a lower elevation. Base flows are less than 1 cfs and occur in late summer and fall.

Biological/Habitat Data

DEQ BURP stream inventory results showed a wide range of percent fine results with very high percent fines found in the low gradient, meadow sections of Round Valley Creek and lower percent fines found in the section that runs parallel to Highway 55. The BURP scores showed a lack of diversity in the macroinvertebrate community and a corresponding lack of complexity in the habitat (Table 33).

A proper functioning condition assessment of Round Valley Creek was conducted during the summer of 2004. Eight different stream reaches were assessed by the Idaho Association of Soil Conservation Districts and the Soil Conservation Commission. Every section assessed

was rated functional at risk. The upland watershed was determined to not be contributing to riparian degradation. Riparian cover was determined to be inadequate for protecting banks and Round Valley Creek was determined to be subject to excessive erosional and depositional forces. The Idaho Soil Conservation Commission report identified excess sand, over-utilization of the riparian area by livestock and diversions (addition of flows) as the main causes of channel instability (ISSC 2004).

Round Valley Creek consists primarily of pastureland. Since overland runoff was not considered to be a significant input of sediment, DEQ conducted channel erosion inventories in 2004 to determine bank erosion rates. Overall channel stability was evaluated and the results are presented in Figure 74. Not all properties on Round Valley Creek were inventoried and, thus, channel erosion rates were extrapolated from measured areas to similar areas that were not inventoried

Channel erosion was not excessive in Round Valley Creek downstream of where it enters the Highway 55 canyon. However, excessive erosion was found in sections in the meadow area upstream. Banks were less than 80% stable.

Table 33. Round Valley Creek: DEQ Water Body Assessment Scores.

Stream ID	SHI	SMI	SFI	Water Body Assessment Score	Beneficial Use Support Status
1995SBOIA014 (lower Round Valley Creek)	1	1	No data	1	Not Full Support
1995SBOIA015 (middle Round Valley Creek)	1	<minimum	No data	<1	Not Full Support
1995SBOIA016 (upper Round Valley Creek)	1	No data	No data	Not Assessed	Not assessed
2002SBOIA024 (Chipps Creek-tributary to Round Valley Creek)	1	0	No data	0.5	Not Full Support
2002SBOIA022	1	2	No data	1	Not Full Support

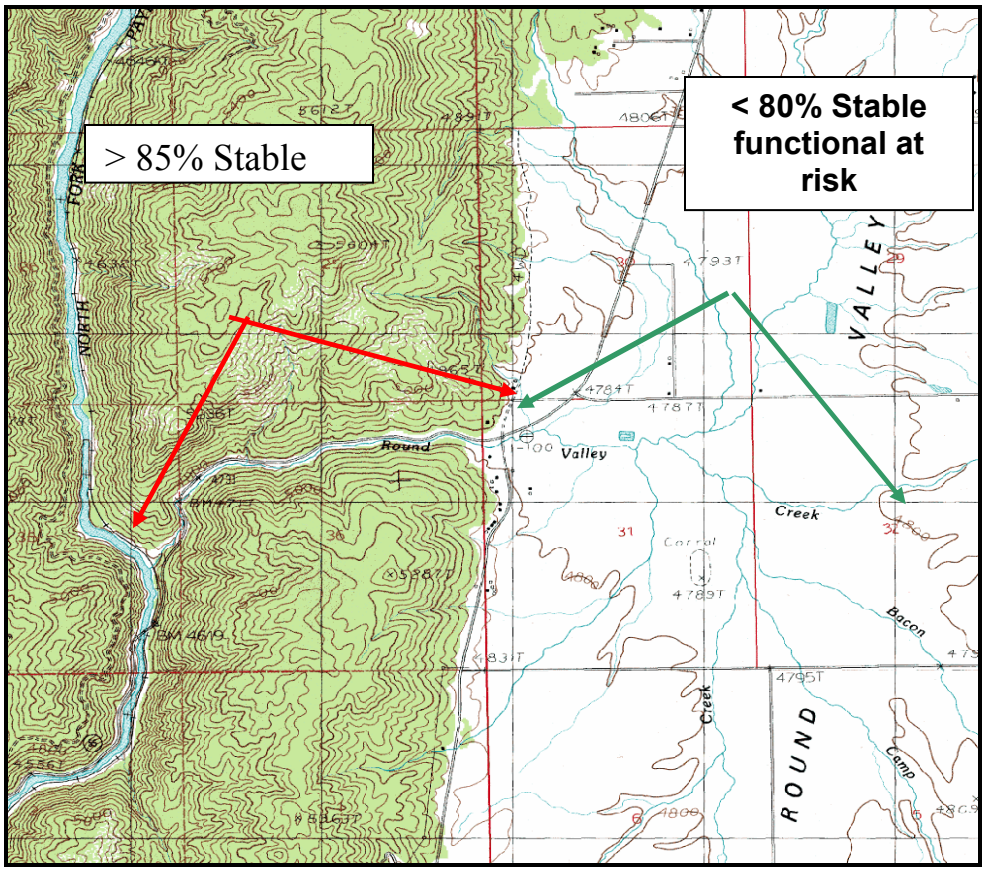

Figure 74. Round Valley Channel Erosion Inventory Results.

Conclusions

Round Valley Creek is listed on the 1998 303(d) list for sediment. High percent fines found in the middle and upper reaches of Round Valley Creek indicated that sediment is impacting beneficial uses and a TMDL is necessary. Channel erosion inventories were conducted in 2004 to determine a sediment TMDL and the results of these inventories were used in the TMDL allocation.

Soldier Creek

Soldier Creek originates at over 5,400 feet. A low volume rangeland stream that typically goes dry in July, Soldier Creek is a 3rd order tributary to Little Squaw Creek, which then drains into Squaw Creek. Draining 15,427 acres, the creek runs approximately 9 miles through Columbia basalt formations before entering Little Squaw Creek at approximately 3,000 feet (Figures 75 and 76). The creek shows Rosgen A and B characteristics.

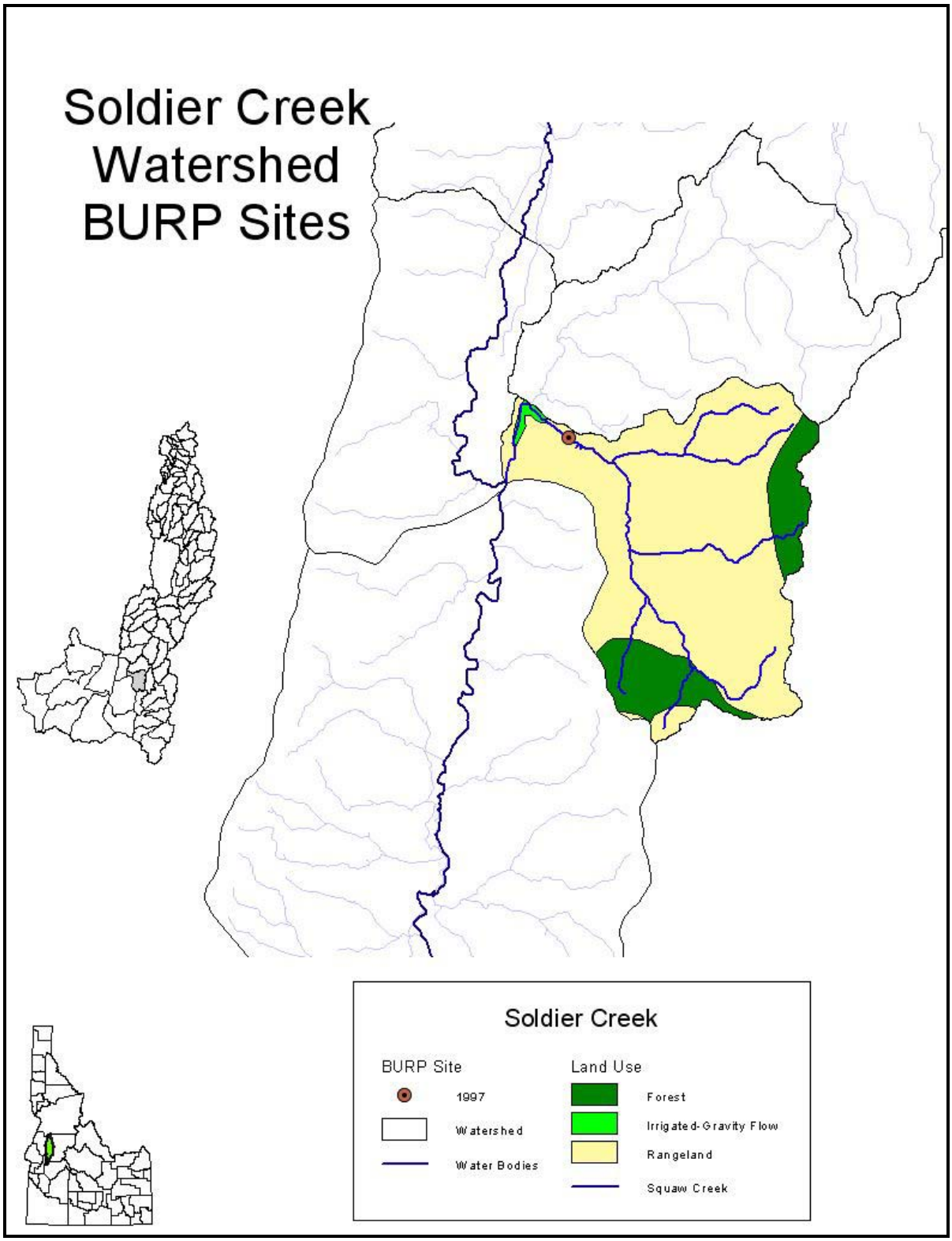

Figure 75. Soldier Creek Monitoring Sites.

Figure 76. Soldier Creek: Middle Reach.

Flow Characteristics

Soldier Creek is a low volume rangeland stream. Little flow information exists for Soldier Creek. However, portions of Soldier Creek are intermittent and the creek is dry by early July in the lower elevation reaches.

Biological/Habitat Data

DEQ water body assessment scores indicated that beneficial uses were impaired (Table 34). The DEQ monitoring sites are shown in Figure 75. Fisheries data showed one to two age classes of fish (dace and bridgelip suckers).

Soldier Creek flows through rangeland and is subject to sediment inputs from both roads and grazing activities. Channel erosion surveys were conducted in 2004 because in-stream channel erosion was surmised to be the biggest contributor of sediment. In the middle and upper reaches of Soldier Creek, the banks were >85% stable and sediment does not impair beneficial uses. Slightly elevated surface fines (32%) were also seen in 1997 DEQ stream inventory data in the lower reach, which has a low gradient where sediment is more likely to be deposited. As a comparison, reference conditions in similar streams of volcanic origin averaged 27% surface fines. Lack of flow late in the season adversely affects fisheries, but this appears to be a natural condition. Fish communities are not robust because lack of water precludes yearlong use of the stream.

Table 34. Soldier Creek: DEQ Water Body Assessment Score.

Stream ID	SHI	SMI	SFI	Water Body Assessment Score	Beneficial Use Support Status
1997SBOIB009	1	2	<minimum	< minimum	Not Full

DEQ was unable to gain access to the lower reaches of Soldier Creek in 2004. This section was evaluated in 1997. While sediment is transported to this reach from the upper segments, these amounts are not excessive. Sediment inputs in this section would most likely be from streambank erosion and excess sediment delivery would most likely occur during high water events. This previously evaluated section is different from the sections analyzed in the erosion inventory because it includes irrigated pastureland.

Conclusion

Soldier Creek is listed on the 1998 303(d) list for sediment. DEQ proposes de-listing Soldier Creek from the headwaters to the confluence with North Fork Soldier Creek (17050122SW012-02). Assessment unit 17050122SW012-03 would remain on the 303(d) list) which encompasses the lower section of Soldier Creek that flows through irrigated pastureland. The Idaho Department of Agriculture will be sampling Squaw Creek biweekly above and below Soldier Creek in 2005. DEQ will use this data to determine whether sediment is impairing beneficial uses in the lower section by looking at the suspended sediment data. Lack of flow appears to be the primary driver that precludes a robust fishery from developing. The intermittent nature of Soldier Creek in the upper reaches prevents cold water aquatic life from being an existing use in the summer months.

Squaw Creek

The Squaw Creek watershed drains approximately 218,900 acres with an estimated average runoff of 110,000 acre-feet/year, making it one of the largest tributaries to the Payette River (Figures 77 and 78). The headwaters of Squaw Creek originate in forested land at over 7,000 feet and it enters Black Canyon Reservoir at just over 2,500 feet. There are two wide valley types within the lower Squaw Creek drainage: Ola Valley and Sweet Valley. The lower 20 miles of Squaw Creek runs through about 7,000 acres that is under some form of surface irrigation. 180-acre Sage Hen reservoir is located in this watershed and is a popular fishery. Land use is predominantly rangeland with irrigated agriculture concentrated in the lower reaches. Agriculture represents over 50% of the economy in this watershed. The majority of irrigation is flood irrigation. Livestock use is primarily cattle.

Figure 77. Squaw Creek at Mouth.

Squaw Creek has resident redband trout and also bull trout in its upper reaches.
The second fork of Squaw Creek exhibits F4 Rosgen characteristics, which means that the stream is a deeply entrenched, low gradient, gravel dominated channel with a high width/depth ratio.

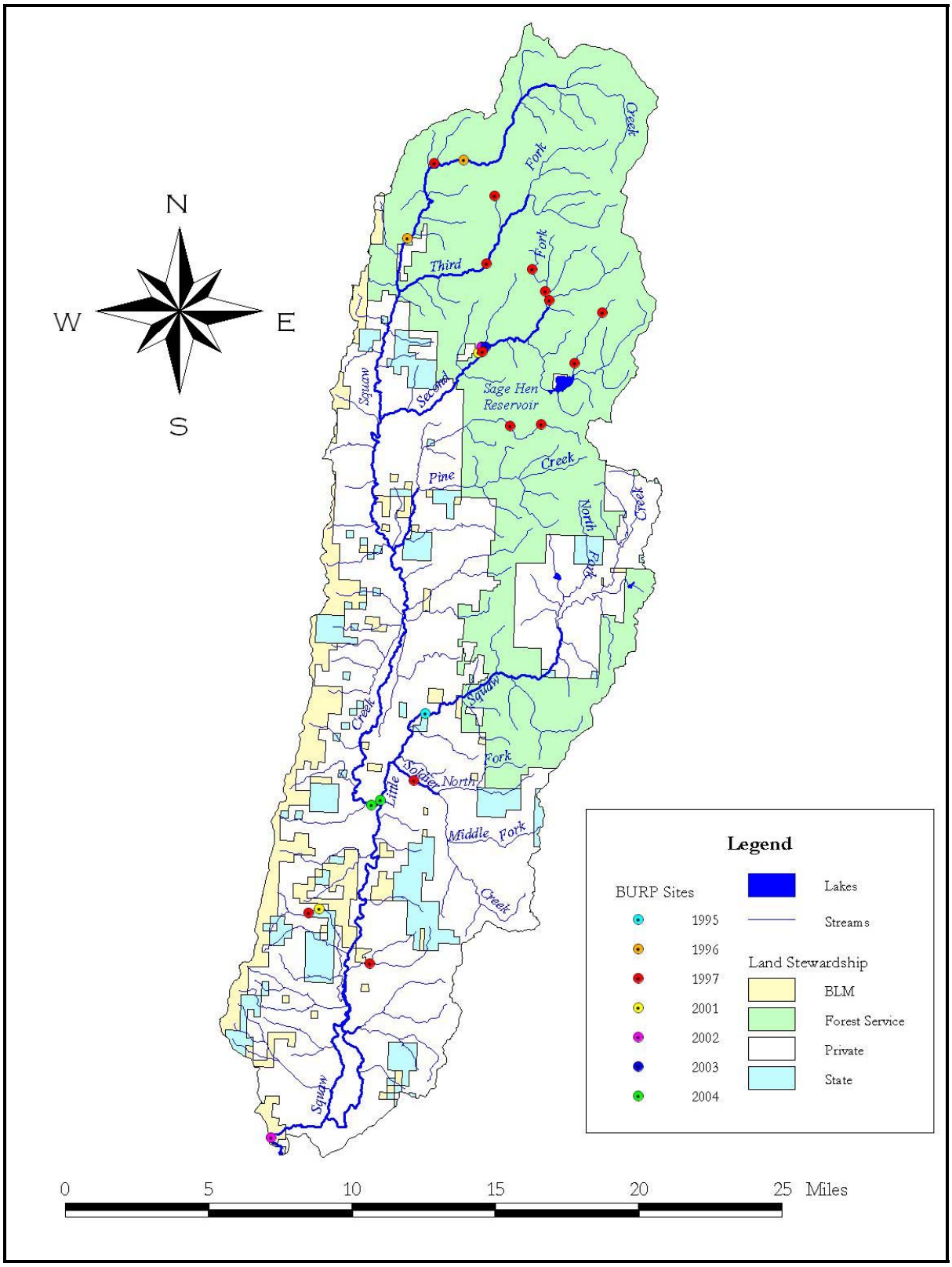

Figure 78. Squaw Creek Land Ownership and BURP Monitoring Sites.

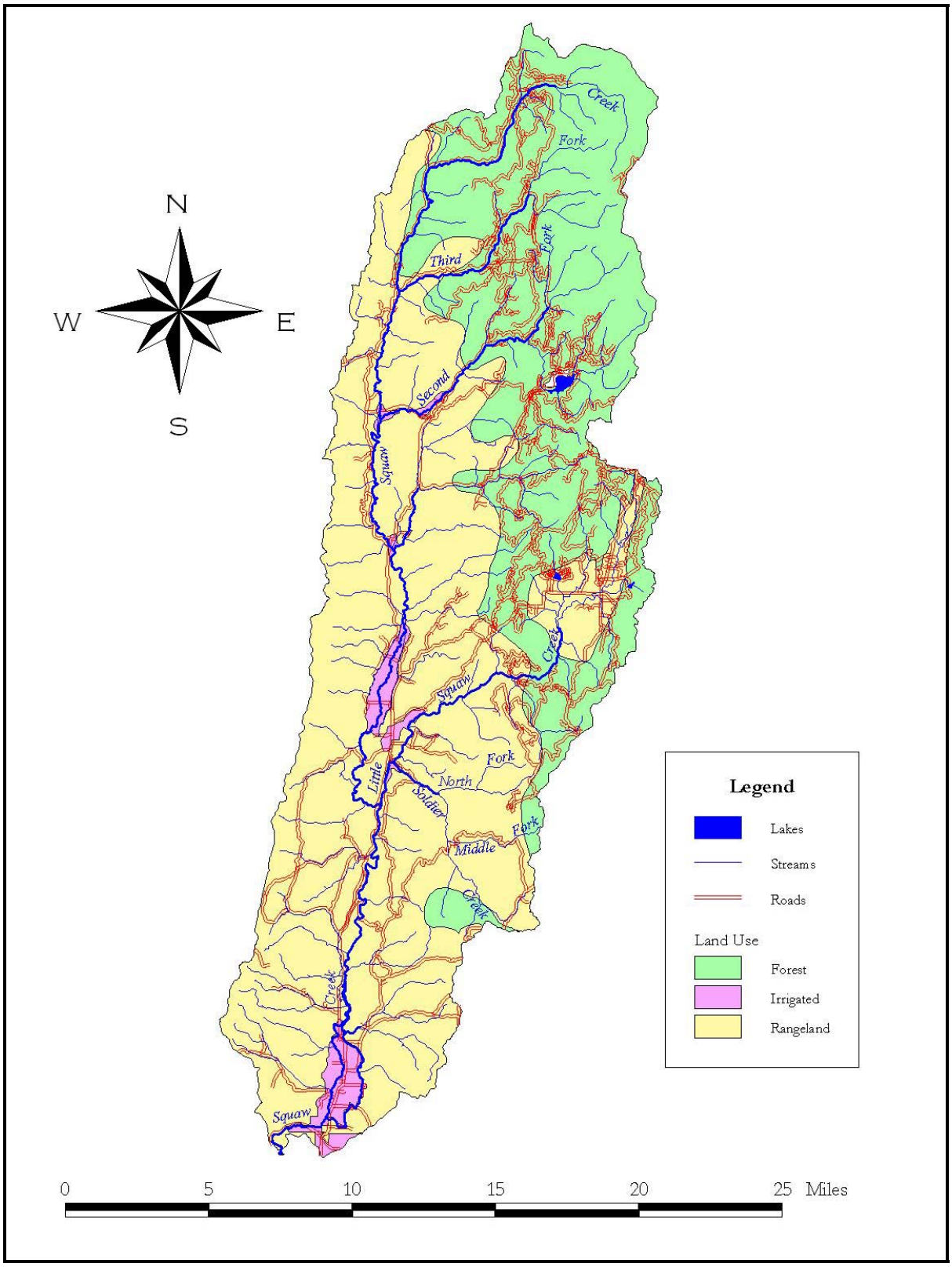

Figure 79. Squaw Creek Land Use.

Flow Characteristics

Figure 80 shows the hydrograph for Squaw Creek near Sweet. Runoff begins in late March and flows can stay high through May and June.

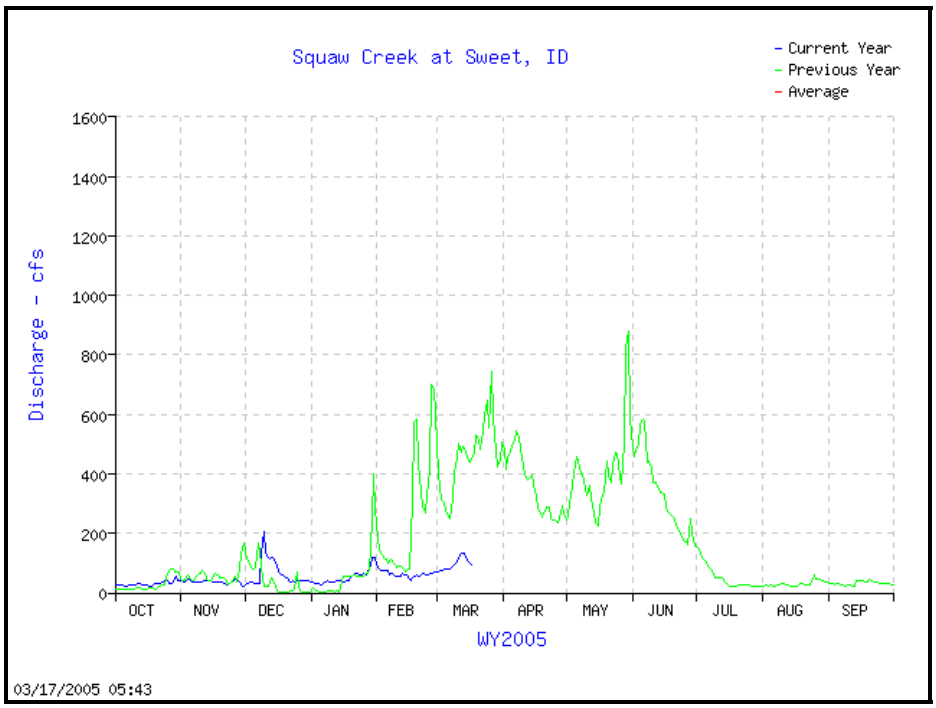

Figure 80. Squaw Creek Flow at Sweet: Water Year 2004.

Water Column Data

DEQ collected 5 bacteria samples between July 30th and August 26th 2004. The geometric mean for the five samples was 325 organisms/100 ml, which violates the state standard for bacteria (geometric mean at or below 126 organisms/100 ml). The Idaho Department of Agriculture will sample Squaw Creek in several locations in 2005 in order to provide a better bacteria source assessment.

Total phosphorus samples were collected near the mouth of Squaw Creek during 2004 (Figure 81). While phosphorus levels were elevated over the EPA Gold Book target of 0.05 mg/L for total phosphorus for waters that directly discharge to a reservoir, because Black Canyon Reservoir is not impaired by excess nutrients a TMDL allocation is not necessary. Monthly averages (from biweekly monitoring) were all below 0.1 mg/L. EPA (1986) recommends that monthly average instream concentrations of total phosphorus be below 0.1 mg/L. However, additional monitoring will occur in 2005 by the Idaho Department of Agriculture to determine longitudinal trends in nutrient concentrations. DEQ will then use these results in conjunction with habitat data to assess whether excessive nutrient concentrations exist in Squaw Creek.

Suspended sediment concentration results were all below 50 mg/L and most samples were below 25 mg/L.

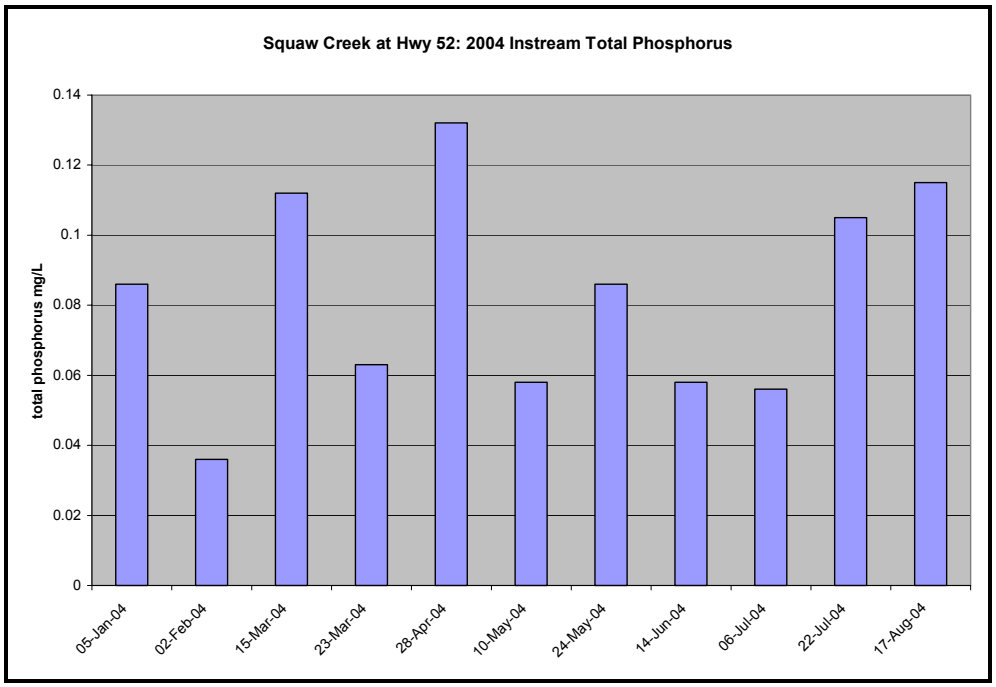

Figure 81. 2004 Total Phosphorus Concentrations: Squaw Creek.

Temperature

Preliminary USFS temperature data showed exceedances of the Bull Trout temperature criteria in the upper elevations in the Squaw Creek watershed. However, the USFS had concerns about the validity of these monitoring results due to uncertainty on whether loggers were deployed correctly. A more comprehensive temperature monitoring program will be initiated in Summer 2005.

Biological/Habitat Data

DEQ water body assessment shows that Second and Third Fork Squaw Creeks do not have impaired beneficial uses. Both Third and Second Fork Squaw Creeks met the riparian management objectives established by the USFS. 2004 DEQ BURP water body assessment scores from Squaw Creek upstream of the confluence with Little Squaw Creek and scores from Little Squaw Creek are not available yet.

Table 35. Upper Squaw Creek Tributaries, Little Squaw Creek, Second Fork Squaw Creek: DEQ Water Body Assessment Scores.

Stream ID	SHI	SMI	SFI	Water Body Assessment Score	Beneficial Use Support Status
2001SBOIA054 (Second Fork Squaw Creek)	3	3	3	3	Full Support
2002SBOIV004 (Second Fork Squaw Creek)	3	3	No data	3	Full Support
1997SBOIA18 (Third Fork Squaw Creek)	3	3	No data	3	Full Support
1997SBOIA044 (Cold Springs Creek-Upper Squaw Creek Tributary)	3	3	No data	3	Full Support
1997SBOIA045 (Mesa Creek-Upper Squaw Creek Tributary)	3	3	No data	3	Full Support
1997SBOIA055 (Joes Creek-Second Fork Squaw Creek Tributary)	3	3	No data	3	Full Support
1997SBOIA056 (Woody Creek-Second Fork Squaw Creek Tributary)	2	3	No data	2.5	Full Support
1997SBOIA057 (Renwyck Creek-Second Fork Squaw Creek Tributary	3	2	No data	2.5	Full Support
1997SBOIA058 (Antelope Creek-Second Fork Squaw Creek Tributary)	3	3	No data	3	Full Support
1995SBOIB24 (Little Squaw Creek)	3	3	No data	3	Full Support

Fisheries

There are three bull trout population watersheds within the Squaw Creek watershed: Squaw Creek, Third Fork Squaw Creek, and Second Fork Squaw Creek. Existing populations occur in Third Fork, Second Fork, and Main Squaw Creek in the upper reaches. Historically, bull trout were found in the lower reaches of Squaw Creek, suggesting that Squaw Creek is also a migratory corridor.

Spawning habitat is lacking large woody debris, which may account for the lack of large pools. Third Fork Squaw Creek is at risk for excess fine sediment, which could also account for the lack of large pools. The Second Fork Squaw creek has migration barriers as well as excess fine sediment, which hinder the development of the bull trout community.

Idaho Fish and Game has found redband trout in the upper reaches of Squaw Creek.

Conclusions

Squaw Creek is not listed on the 303(d) list, but 2004 sampling showed bacteria violations, and bacteria is proposed for listing on the 303(d) list. Nutrient levels are also above target concentrations, and nutrients are proposed for listing on the 303(d) list. This listing is for assessment unit 17050122SW010-05 that encompasses the fifth order portion or lowermost reaches of Squaw Creek below Second Fork Squaw Creek. The upper reaches do not have impaired beneficial uses. In 2005, more intensive sampling will take place in the lower Squaw Creek watershed below the Second Fork of Squaw Creek to determine nutrient and bacteria concentrations throughout the lower part of the drainage. In addition, temperature monitoring in bull trout habitat areas will be undertaken, and a temperature TMDL determined if necessary.

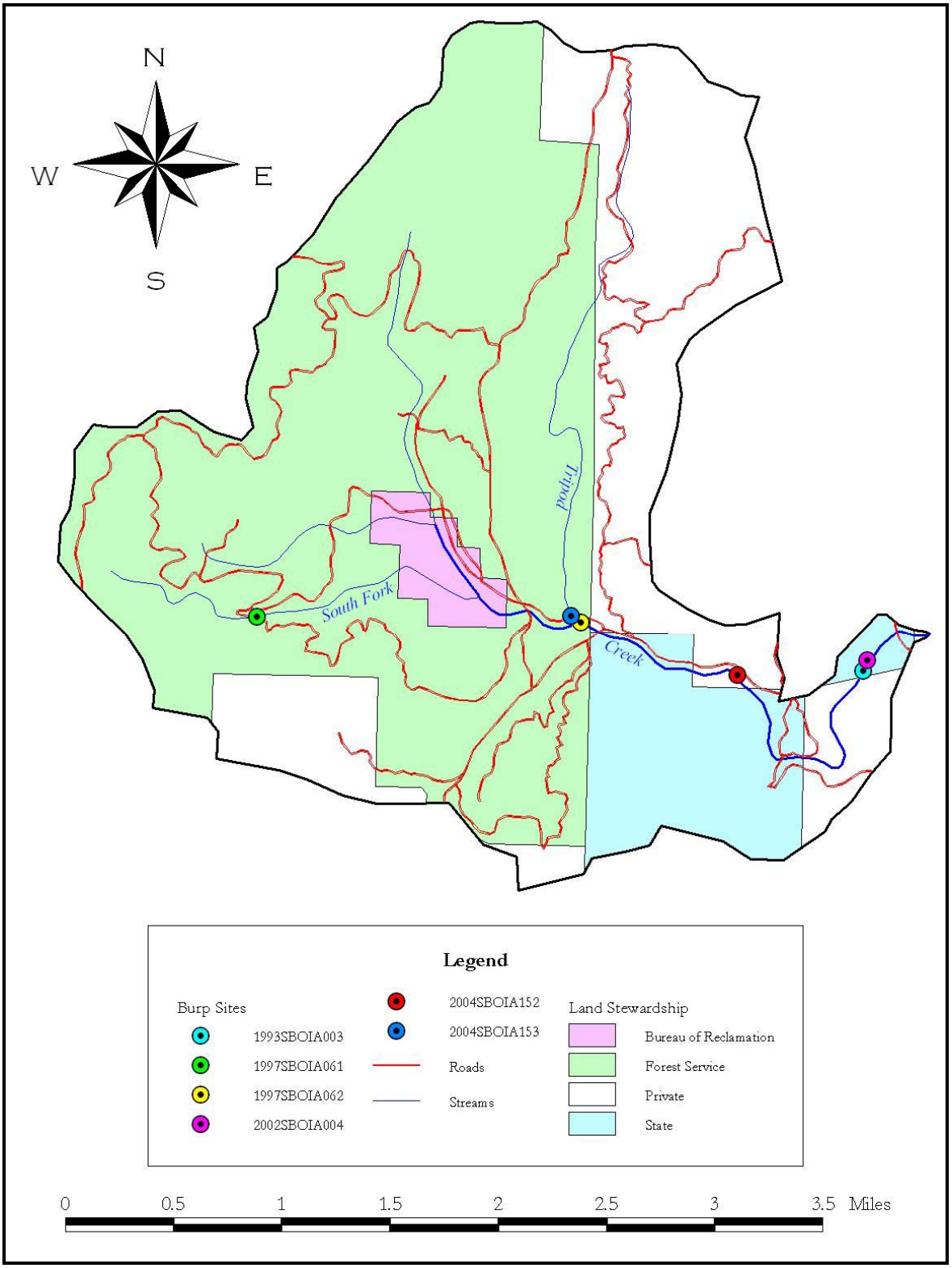

Figure 82. Tripod Creek Hydrology, Land Use and Monitoring Sites.

Figure 83. Tripod Creek below Tripod Meadows.

Tripod Creek

Tripod Creek is a 3rd order stream that drains 8.63 square miles (Figure 82 and 83). Originating at approximately 6,000 feet in elevation, Tripod Creek flows through both forested and meadow areas before entering the North Fork Payette River at Smiths Ferry at 4,500 feet. The stream channel has both Rosgen B and C characteristics, depending upon gradient. Grazing, timber harvest and recreational activities all take place in the watershed. Tripod Reservoir, a five-acre impoundment, is located at 4,980 feet.

Flow Characteristics

Very little hydrology information exists for Tripod Creek. Logging, grazing and recreational uses occur in this watershed. USGS measured flows intermittently between 1973 and 1980; flows ranged from 0.22 cfs in September to 43 cfs in May.

Biological/Habitat Data

The most recent BURP data indicate that beneficial uses are not impaired in Tripod Creek (Table 36). Figure 82 shows the Tripod Creek monitoring sites. 2004 DEQ BURP water body assessment scores are not yet available.

Table 36. Tripod Creek: DEQ Water Body Assessment Scores.

Stream ID	SHI	SMI	SFI	Water Body Assessment Score	Beneficial Use Support Status
2002SBOIA004	1	3	2	2	Full
1997SBOIA062	1	3	2	2	Full
1993SBOIA003	1	<min	1	<1	Not Full

Channel erosion inventories were conducted in Fall 2004 in the Tripod Meadows area (Figure 84) because grazing was reported to DEQ as potentially impacting stream health. Overall, banks were greater than 85% stable. Localized problem areas exist where cattle have access to the creek. These areas tended to be small in extent. The creek, although small in volume, has deep pools and steep banks that appear to keep cattle out of most areas. A riparian grazing exclosure installed in 1991 has shown that grazing is actually maintaining a meadow condition since lodgepole pine became established inside the exclosure. The riparian area is grazed outside of the maintained exclosure areas. 2004 electrofishing results showed that the meadows reach did not have an impaired fishery. Several age classes of salmonid were present.

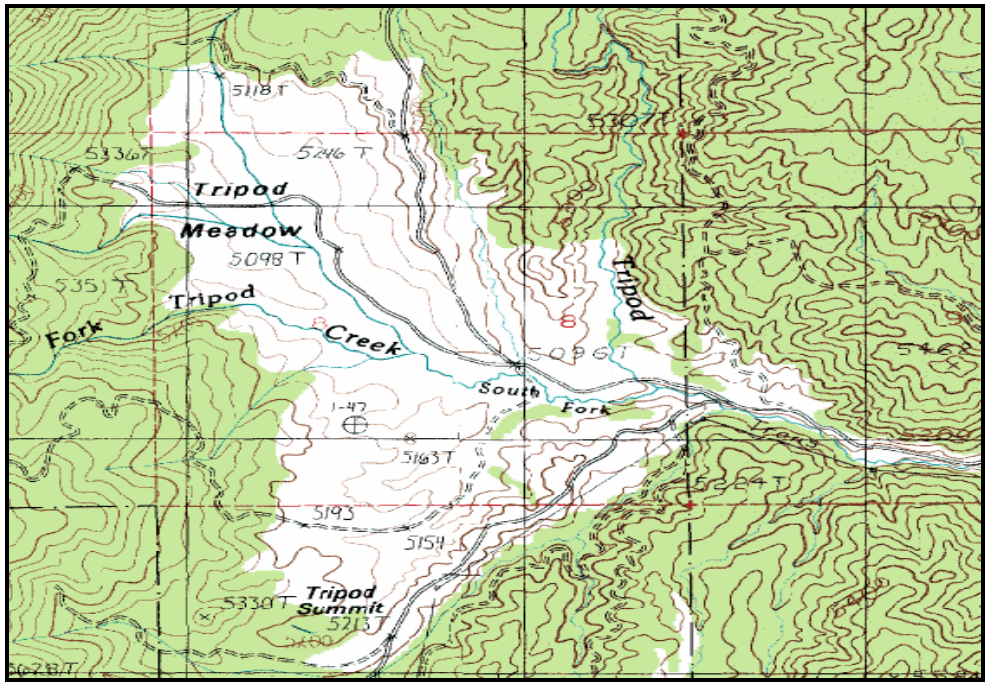

Figure 84. Tripod Meadows Area.

2004 electrofishing results showed four age classes of rainbow trout and three age classes of brook trout in both the Tripod Meadows area and farther downstream where the creek exits the meadow.

Conclusions

Tripod Creek is listed for an unknown pollutant on the 1998 303(d) list and was proposed for delisting on the 2002 303(d) list. The most recent Tripod Creek water body assessment scores indicate that beneficial uses are supported in the lower, forested parts of the watershed. DEQ re-assessed Tripod Creek this year in order to ensure that the upper watershed continues to support beneficial uses. Recreation, roads and grazing occur in this area, and all of these have the potential to contribute sediment to the stream or adversely affect the riparian area. No impairment of beneficial uses was seen in the second order portion of Tripod Creek (the lower forested portion). 2004 water body assessment scores are unavailable at this time. However, beneficial uses do not appear impaired as supported by fisheries data. Tripod Creek is recommended for de-listing for an unknown pollutant.

2.5 Data Gaps

The best available data were used to develop the current subbasin assessment and TMDL. The data were used to reach conclusions of support status and to develop defensible TMDLs. However, DEQ acknowledges there are additional data that would be helpful to increase the accuracy of the analyses. The data gaps that have been identified are outlined in Table 37.

Table 37. Data gaps Identified During TMDL Development.

Pollutant or Other Factor	Data Gap
Flow	Clear Creek, Big Creek, Round Valley Creek
Biological (fish and macroinvertebrates)	Landing Creek (fish), North Fork Payette River (fish/macroinvertebrates),
Bacteria	Longitudinal results for the Squaw Creek watershed
Sediment	North Fork Payette River (bedload sediment), Big Creek complete erosion inventory of creek
Dissolved Oxygen	Substrate/water interface dissolved oxygen measurements Continuous dissolved oxygen measurements taken at the end of the river reach
Temperature	Box Creek during spawning season
Nutrients	Increased monthly sampling of nutrients, assessment of phosphorus recycling in system